

NOTES ON HURRICANES OF 1918.

By C. A. DONNEL, Meteorologist.

[Dated: Weather Bureau, Washington, D. C., Jan. 28, 1919.]

As in the preceding year, storms of tropical origin (so-called West Indian hurricanes) were fewer in number during 1918 than usual. One storm only attained characteristics entitling it to classification as a hurricane of the first rank in intensity. The paths of five disturbances, however, have been traced on Chart X of this issue of the MONTHLY WEATHER REVIEW.

Storm of August 1-6.—This was the most important tropical disturbance of the year. Five days after having been first noted near the island of Barbadoes it had crossed the Caribbean Sea and the Gulf of Mexico, reaching on the 6th the Gulf Coast of the United States about 30 miles east of the mouth of the Sabine River. In the REVIEW for August, 1918 (p. 379), appears a detailed account of this storm.

Storm of August 22-25.—First coming under observation in the vicinity of the Windward Islands on August 22, this storm during the succeeding 72 hours traversed a path only slightly north of due west across the central Caribbean Sea. On the 25th the disturbance reached the coast of British Honduras, whence it passed inland and probably dissipated. Like its immediate predecessor, this storm moved with great velocity for a tropical storm, the rate exceeding 15 miles an hour. It is reported that the S. S. *Mohegan* of the U. S. Aluminum Co., encountered this storm in latitude 14° 18' north, longitude 66° 15' west.

Storm of September 3-7.—The earliest report of the existence of this storm came from the Swedish S. S. *Texas* on September 3, the vessel then being some distance southeast of Bermuda, in latitude 25° 42' north, longitude 59° 43' west. Thence the storm advanced northwestward, passing to the west of Bermuda on the night of the 4th-5th. The storm recurved some distance out to sea from the coast of the United States, but crossed Nova Scotia on the night of the 6-7th, much diminished in intensity. The lowest reported pressure for this storm was 28.88 inches, at Hamilton, Bermuda, on the 4th.

Storm of September 9-14.—So far as is known, this disturbance did not attain violent character. It was first noted on the 9th near Barbadoes Island, and thence a track toward the northwest, across the eastern end of the Caribbean Sea, was taken. After crossing Haiti on the 12th, the path inclined to a more nearly northerly direction, and the storm at last disappeared on the 14th near the Great Abaco Island. In connection with this disturbance the Danish S. S. *Jungshoved* encountered a gale in latitude 23° 9', longitude 27° 43'.

Storm of September 26-28.—The first evidences of this disturbance were present on September 26th in the extreme western portion of the Caribbean Sea, off the coast of British Honduras. On the morning of the 27th the storm was apparently in the Gulf of Mexico north of Yucatan. On the following day it had reached the northeastern Gulf, after having united with a disturbance from the interior of the United States. The storm did not progress farther than the Florida peninsula. In Pineallas County, Fla., and the near-by Gulf destructive winds occurred as a result of this storm, but no widespread damage was reported.

TROPICAL CYCLONE OF SEPTEMBER 14-17, 1918, IN THE PACIFIC OCEAN JUST WEST OF MEXICO.

By F. G. TINGLEY.

[Dated: Weather Bureau, Washington, D. C., Jan. 20, 1919.]

During the period from about September 14 to 17, 1918, a severe tropical storm prevailed in the Pacific Ocean immediately to the westward of the Mexican mainland. As there is comparatively little shipping in this part of the ocean, only a few reports have reached the Weather Bureau from vessels which felt the influence of the storm, but from other sources it is known that considerable loss was sustained by shipping and also by various land interests at the extreme southern end of the Lower California Peninsula. Here the storm, having reached a land area, appears to have lost intensity.

According to a report which has reached the Bureau from Capt. E. Y. Hansen, of the Danish S. S. *Delagoa*, which encountered the storm, that vessel had an unusual experience. Running south in ballast along the west coast of Mexico, the influence of the storm was first felt on September 14, in about latitude 19° 00' N., longitude 106° 00' W. As the vessel and the storm center—the latter moving in a northwesterly direction—approached each other and the violence of the storm was felt more and more, the ship became increasingly difficult to steer and kept heading into the sea and practically toward the storm center. From 1 p. m. to 6 p. m. of September 15 it was necessary to keep the engine going astern to overcome the ship's tendency to follow the storm and not until the latter hour could the vessel be brought round and the course be resumed. The *Delagoa* is a ship of 3,541 gross tons. The report from Capt. Hansen is as follows:

September 14, 1918.—Increasing swell from ESE. During the afternoon reduced revolution, as propeller was jumping out of water. At midnight wind ENE., force 3; bar. 759 mm. (29.88 in.).

September 15, 1918.—Increasing strength of wind from NE. and high running sea from SE. At 4 a. m., bar. 753 mm. (29.65 in.); wind NNE., 10; sea SE., 10. Air very thick and rainy. Fog signal. On account of the different directions of wind and sea, the appearance of the air, and the ever falling glass, it was evident that a cyclone was approaching. At 5 a. m. endeavored to escape by steering SW., but as the ship was in ballast it proved impossible to steer her and she continued on a southerly course with the wind on the port quarter. (Latitude 19° 00' N., longitude 106° 00' W.) The wind blew from NNE. and at 6 a. m. reached the strength of a gale. The sea kept running high from the SE. At 8 a. m. the gale had increased to a violent hurricane accompanied by tremendous squalls and an exceptionally high and breaking sea. Bar. 736 mm. (28.98 in.), wind and sea 12. The ship was drifting southerly. She labored and was pitching and rolling fearfully and received terrific blows under the bottom.

The storm center passed close north and east of the ship at 10 a. m. The force of the gale was then at its highest. Bar. 732 mm. (28.82 in.). The wind now gradually shifted through N. and NW. to W. and, at about 1 p. m., to SW. The sea turned from SE. to E. and NE., at 5 p. m. first commencing to run with the gale from the SW. The hurricane continued with unabated strength till 4 p. m., then decreased to a strong gale from the SW. The ship kept heading the sea with the wind on the port quarter and by 11 a. m. was heading north. An attempt was made to get the stern through the wind by letting the engine go astern in order to come on a southeasterly course, and thus escape after the center had passed, but the ship refused to steer. From 1 p. m. the engine was kept going astern to enable us to increase the distance from the center, as the ship practically was heading right after it.

At 6 p. m. the ship came round and a south-southeasterly course was shaped.

The American S. S. *City of Para*, Capt. G. McKinnon, bound from Balboa to San Francisco, encountered the storm on September 16 while in latitude 22° 00' N., longitude 110° 02' W. The greatest force of the storm

was felt during the night of the 16th-17th, when the barometer fell to 29.35 inches and the wind attained a force of 9 from the west-northwest.

Following is the report from Mr. B. F. Yost, United States consul at Santa Rosalia, Lower California:

The greatest damage done at La Paz was to the shipping; every boat in the bay was blown upon the beach, all being more or less damaged

The American steamer *Sun Gabrien*, due at La Paz about that time, with a large general cargo, has failed to arrive and is reported lost, the crew having arrived at San Diego some days ago, according to newspaper accounts. Another American steamer, the *Coos Bay*, outward bound from San Francisco, is reported lost with all on board. Other vessels which had been reported lost are gradually being heard from.

Reports from San José del Cabo would indicate that the storm was extremely severe there. Small creeks became raging torrents, taking everything in their path and washing houses and trees into the sea.

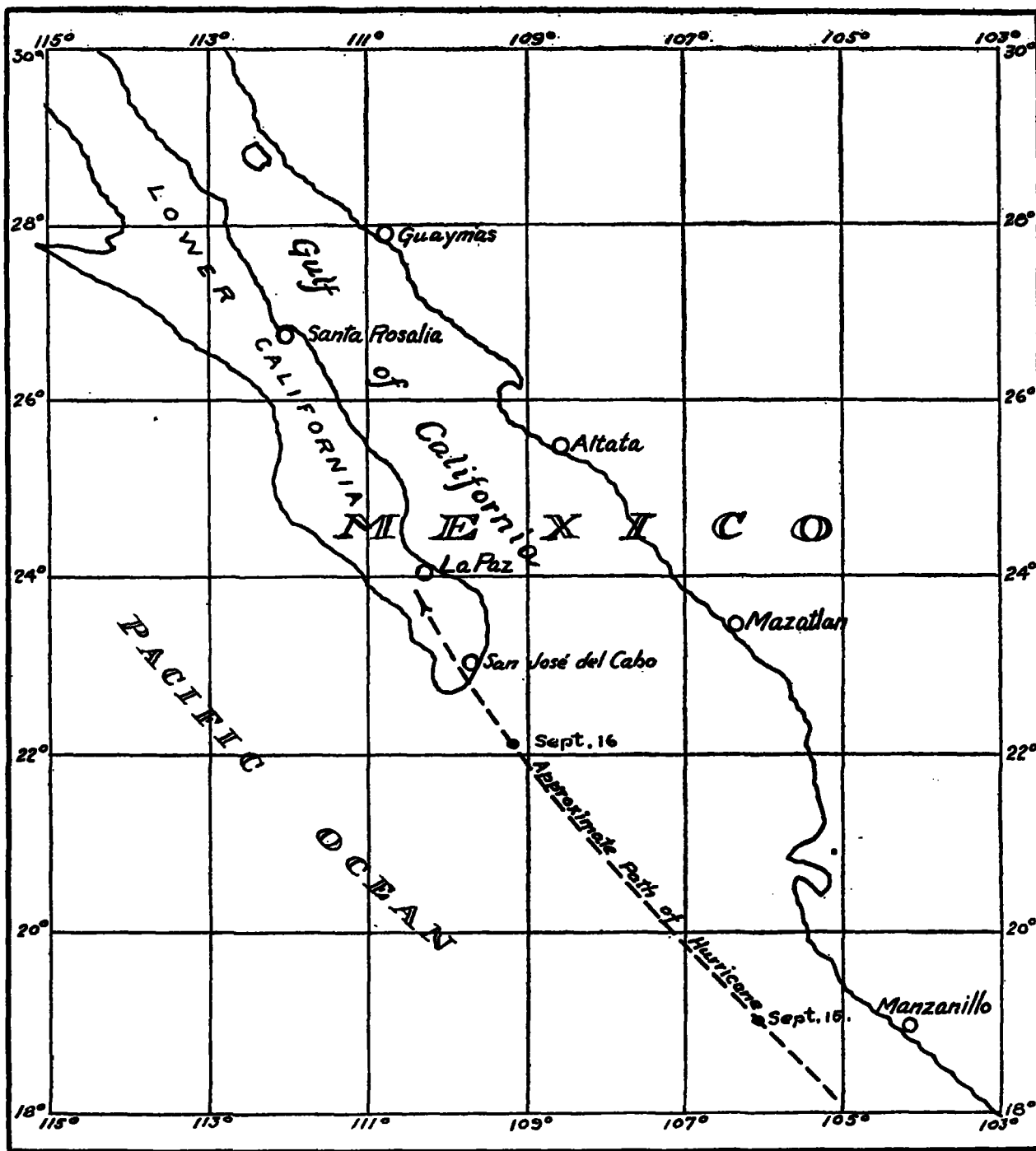


FIGURE 1.—Approximate path of tropical storm of September 14-17, 1918, North Pacific Ocean.

and some totally wrecked. As La Paz is chiefly a maritime community, many people had all their savings invested in small sloops engaged in the coasting trade. Some of these vessels were totally destroyed, while others it has been impossible to repair thus far on account of the total absence of the necessary materials, such as oakum, copper sheets, and copper nails. The result is that most of the vessels are still on the beach waiting to be repaired before they can be refloated. The damages at La Paz and neighborhood will probably reach a total of 200,000 pesos. The N. and NE. winds did the greatest damage.

Many people lost their lives by drowning or by falling trees, the number of dead thus far accounted for being 25. San José being the center of the sugar-cane industry, that crop suffered considerable damage; other crops have suffered in proportion.

The communities of Santiago, Miraflores, and San Bartolomé were severely struck by the storm, although no deaths have been reported from those places. However, much damage was wrought to the growing crops. At Triunfo the storm was evidently less violent, but about 20 inches of rainfall is reported. Many houses were wrecked and most of

the roofs blown off. Nearly every building suffered more or less damage.

From all information obtainable the storm seems to have been confined to the southern part of the peninsula, being very serious in the San José del Cabo district, and probably reached some distance into the sea. It extended very little northeast or west of La Paz. The effects of the storm in Mazatlan, Altata, and Guyamas were not so noticeable, but a heavy southwest swell was felt. At Santa Rosalia very little wind was registered, and it never reached the velocity of a storm. A heavy southeast swell continued for two days without doing any material damage, except the washing out of a piece of track of the Boleo Co. Shipping schedules in this part of the gulf were somewhat deranged. It was thought that the 11 German sailing vessels anchored off Santa Rosalia might suffer damage, but they withstood the running sea in splendid condition.

The total damage wrought in the storm area, not counting the ships lost at sea, is estimated at about half a million pesos.

So far as existing records show, violent storms are of rare occurrence in this part of the North Pacific Ocean. It is, therefore, interesting to note in connection with the present one that it occurred in a year of few hurricanes in West Indian waters, some hundreds of miles to the eastward. It may be noted also that in 1918 precipitation set in on the Pacific coast at a very early date, almost unprecedented rainfall occurring in northern California during the period from September 12 to 15 or at about the time the storm off the Mexican coast must have had its inception.

THE COLD WINTER OF 1917-18.

By PRESTON C. DAY.

(Dated: Washington, D. C., Jan. 20, 1919.)

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The severity of the weather experienced during December and January of the winter of 1917-18 over the greater part of the United States east of the Rocky Mountains, and also over much of Canada and Alaska during the early part of the period, was so unusual as to the length of time the low temperatures persisted, the great area involved, and the degree of cold maintained, that some discussion of the contributing factors, and comparison with similar occurrences of previous years, seems desirable.

WEATHER PRECEDING DECEMBER, 1917.

Reviewing somewhat the weather for a few months prior to December, 1917, we find that September was a cold month over much of the eastern half of the United States; but in Canada, particularly in the Northwest Provinces, the month was distinctly warm. October was a cold month in all portions of the United States from the

Rocky Mountains eastward. In fact, it partook largely of the characteristics of a winter month in the great central valleys. Freezing weather occurred throughout nearly all portions of the country; the earliest frosts of record were reported from points in the Southwest; and unusually heavy snows occurred near the end of the month in the Lake region and northern Appalachian districts. (1), (4-7). Over the whole of Canada, except the extreme eastern and western portions, the month was likewise cold, although the departures of the mean temperature from normal were not generally so large as in the adjoining portions of the United States.

Cold weather continued during much of November over the eastern districts of the United States and Canada; but from the Mississippi River westward and in central and western Canada the month was, as a whole, much warmer than the average. In fact, it was among the warmest of record for November in the northern Great Plains and the adjoining portions of the Canadian Northwest, and warmer in portions of the Dakotas by several degrees than the preceding month of October.

In view of the marked warmth of November over certain districts, immediately following a month or more of generally low temperatures, and preceding a long period of intense cold, an unusual opportunity is afforded for a detailed survey of the atmospheric pressure, the resulting movement of the Highs and Lows, and the surface drift of the winds during that month as well as succeeding winter months, to determine an explanation of the causes immediately responsible for such marked variations in weather conditions over the United States.

Barometric data for the United States and the districts to the northward, including the far northwestern stations of Canada and the special stations maintained in Alaska, as well as reports from ships plying the North Pacific, have been carefully charted for the months November, 1917, to February, 1918, inclusive. These charts show the daily departures of the actual surface pressure from the normal, and indicate the deflection of the surface winds from their usual courses, and the locations of the larger and more permanent areas of high and low pressure, as well as the movements of the smaller cyclones and anticyclones thrown off from these great centers of atmospheric action. The departures shown on the charts are based on 8 a. m. (75th Meridian time) observations except for a few stations in the far northern districts of Canada, the stations in Alaska, and the vessel reports from the North Pacific, where the observations were made at various hours. However, during the winter season in these northern regions the normal diurnal fluctuations in pressure are slight, and probably no material error has arisen from the use of these data without correction.

An examination of these charts discloses the dominating factor controlling the November weather over the United States to have been a persistent area of high pressure over the interior portions of the United States, and the adjoining districts of the Canadian Northwest. Over the coast districts of Alaska and British Columbia and the nearby portions of the North Pacific Ocean, on the contrary, low pressure was equally persistent.

November is usually a month of considerable storm activity, particularly over regions adjacent to the higher latitudes of the North Pacific, and low-pressure areas frequently move off the ocean into the Pacific States or British Columbia, whence they pursue eastward or south-eastward courses toward the Atlantic coast. Likewise high-pressure areas usually move into the Northwestern States from the British Provinces during the month.